WHAT IS CLAIMED IS:

1. A fuel reforming apparatus for simultaneously achieving a steam reforming reaction that produces hydrogen from a hydrocarbon and steam and a partial oxidation reaction that produces hydrogen from the hydrocarbon and an oxidizer and using heat generated by the partial oxidation reaction that is an exothermic reaction to cover heat for the steam reforming reaction that is an endothermic reaction, comprising:

a first catalyst with a support, for promoting the steam reforming reaction and partial oxidation reaction;

a second catalyst with a support positioned upstream from the first catalyst, for promoting the partial oxidation reaction;

fuel feeding means for feeding the hydrocarbon as a fuel upstream from the second catalyst;

first oxidizer feeding means for feeding the oxidizer to the first catalyst;

second oxidizer feeding means for feeding the oxidizer to the second catalyst;

oxidizer controlling means for selectively supplying the oxidizer from an oxidizer source to one of the first and second oxidizer feeding means;

first steam feeding means for feeding steam to the first catalyst;

second steam feeding means for feeding steam to the second catalyst;

steam controlling means for selectively supplying steam from a steam source to one of the first and second steam feeding means; and

master controlling means for controlling the oxidizer controlling means and steam controlling means, wherein:

the master controlling means has first and second states, to control the oxidizer controlling means and steam controlling means in such a manner as to connect, in the first state, the oxidizer source to the second oxidizer feeding means and the steam source to the first steam feeding means, and in the second state, the oxidizer source to the first oxidizer feeding means and the steam source to the second steam feeding means; and

the master controlling means is in the first state during startup and transient operations and is in the second state during

the other operations.

2. The apparatus of claim 1, wherein the master controlling means is switched to the second state after it is maintained in the first state for a predetermined period.

3. The apparatus of claim 1, further comprising:

temperature measuring means for measuring a temperature of the first catalyst and sending an output to the master controlling means, wherein:

the master controlling means is switched from the first state to the second state if the output from the temperature measuring means is equal to a predetermined value.

4. A fuel reforming apparatus for simultaneously achieving a steam reforming reaction that produces hydrogen from a hydrocarbon and steam and a partial oxidation reaction that produces hydrogen from the hydrocarbon and an oxidizer and using heat generated by the partial oxidation reaction that is an exothermic reaction to cover heat for the steam reforming reaction that is an endothermic reaction, comprising:

a first catalyst with a support, for promoting the steam reforming reaction and partial oxidation reaction;

a second catalyst with a support positioned upstream from the first catalyst, for promoting the partial oxidation reaction;

fuel feeding means for feeding the hydrocarbon as a fuel upstream from the second catalyst;

first material feeding means for feeding one of the oxidizer and steam to the first catalyst;

second material feeding means for feeding one of the oxidizer and steam to the second catalyst;

oxidizer controlling means for selectively supplying the oxidizer from an oxidizer source to one of the first and second material feeding means;

steam controlling means for selectively supplying steam from a steam source to one of the first and second material feeding means; and

master controlling means for controlling the oxidizer controlling means and steam controlling means, wherein:

the master controlling means has first and second states,

to control the oxidizer controlling means and steam controlling means in such a manner as to connect, in the first state, the oxidizer source to the second material feeding means and the steam source to the first material feeding means, and in the second state, the oxidizer source to the first material feeding means and the steam source to the second material feeding means; and

the master controlling means is in the first state during startup and transient operations and is in the second state during the other operations.

5. The apparatus of claim 4, further comprising:

temperature measuring means for measuring a temperature of the first catalyst and sending an output to the master controlling means, wherein

the master controlling means is switched from the first state to the second state if the output from the temperature measuring means is equal to a predetermined value.

6. The apparatus of any one of claims 3 and 5, wherein the temperature measuring means at least measures the temperature of a predetermined location in a gas passage on the inlet side of the first catalyst.

7. The apparatus of any one of claims 3 and 5, wherein the temperature measuring means at least measures the temperature of an inside location of the first catalyst.

8. The apparatus of any one of claims 3 and 5, wherein the temperature measuring means at least measures the temperature of a predetermined location in a gas passage on the outlet side of the first catalyst.

9. The apparatus of any one of claims 1 and 4, wherein the hydrocarbon is methanol; and

each of the first and second catalysts is one of a copper-based catalyst and a palladium-based catalyst.

10. The apparatus of any one of claims 1 and 4, wherein the hydrocarbon is methanol; and

the first catalyst is one of a copper-based catalyst and a palladium-based catalyst; and

the second catalyst is an oxidation catalyst.